

Remarks

This Amendment and Response is being submitted in response to the non-final Office Action mailed October 14, 2009. Claims 27-40 are pending in the Application.

Claims 27-32 of the present invention were rejected on the grounds of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 7,175,690 (hereinafter “‘690”) in view of Varajao et al. (hereinafter “Varajao”). Applicant respectfully asserts that Claims 27-32 of the present invention are patentably distinct from Claims 1-5 of the ‘690 patent. Moreover, the present invention is not obvious under ‘690 in view of Varajao.

The Examiner argues that claims 1-5 “of US ‘690 recite a process substantially as presently claimed.” Applicant disagrees that ‘690 claims a process substantially the same as Applicant’s invention. Applicant’s invention is unique in its use of preconditioning iron ore at low temperatures. Specifically, the invention calls for the exposure of the iron ore to a temperature of 150°C to about 200°C. This temperature is significantly lower than the temperature disclosed and taught in ‘690. In contrast to the relatively low temperature of the present invention, ‘690 discloses and teaches the use of a temperature between 200°C and 500°C. Moreover, Applicant’s invention teaches adding the iron ore to the furnace while the ore is at a temperature of 150°C to about 200°C. In contrast, ‘690 discloses and teaches that the ore is added to the furnace while at a temperature of 400°C.

Another difference between the disclosure and teachings of claims 1-5 of '690 and the instant application is the specific limitation related to the water content of the iron ore. The '690 patent is silent regarding the water content of the iron ore. In contrast, each of Applicant's independent claims (27, 34, 35, and 37) specifically includes a limitation that requires drying the iron ore to a water content of "less than 0.5% by weight." The Examiner argues that "it would be expected that the process of US '690 would result in the same content of water, since the process conditions in the present invention and that of US '690 are substantially the same." However, the processes of '690 and the present invention are not the same. The temperature at which the iron ore is treated is significantly different. Different temperatures will certainly have different effects on the water content of the iron ore. Because '690 is silent with respect to the water content, it does not disclose or teach the limitations of Applicant's invention.

The Examiner rejects claim 33 on the grounds of double patenting over claims 1-5 of the '690 patent in view of Varajao and further in view of the article "The Making, Shaping, and Treating of Steel," published by United States Steel (hereinafter "USS"). The Examiner concedes that neither '690 nor Varajao disclose or teach storing the iron ore for at least a month in an open atmosphere stockpile. The Examiner relies on USS for the assertion that the storage for one month limitation is known in the art and renders Applicant's invention obvious. However, USS discusses the storage of iron ore solely for the purpose of having ore to process during months in which ore is not mined or easily shipped. Indeed, USS states:

However, in the case of ore and pellets, weather conditions are often such as to prevent mining and transportation

during the colder months, so during the warm months it is necessary to store approximately one-half year's supply adjacent to the furnaces.

As established by this statement, the storage of ore contemplated by USS is simply a function of the inability to mine or transport ore during the winter. It has nothing to do with reducing the water content or reducing the number of fines produced in the furnace when the ore is reduced. Further, USS is concerned with discussing locations throughout the world where iron ore is mined, not with processing the ore through direct reduction. Applicant agrees that ore kept in a stockpile will eventually be used in processing, but this does not render Applicant's invention obvious.

The Examiner rejects claims 34 – 36 under the judicially created obviousness type double patenting doctrine, as being unpatentable over claims 1-5 of US Patent '690 in view of Varajao and the USS publication. The examiner relies on Varajao to teach microporous ore and claims this teaching renders Applicant's invention unpatentable. Varajao is a study of the microporosity of the iron ore obtained from one specific location in the world, Iron Quadrangle, Brazil. Varajao does not disclose or teach a process for reducing iron ore once it is mined. Further, Varajao does not teach or disclose the limitations claimed in Applicant's invention. Rather, Varajao simply discusses the fact that the iron ore from the Iron Quadrangle in Brazil is microporous. When viewed in light of '690 and USS, Varajao simply gives a characteristic of a particular iron ore. It does not teach Applicant's invention. Moreover, the limitation of using a microporous ore is simply that; the ore to be used in Applicant's invented process must be microporous. It is irrelevant where the ore comes from, or from which mine it is taken,

as long as it has the proper microporosity. As such, the fact that Varajao discloses and teaches that the iron ore from the Iron Quadrangle in Brazil is microporous has no affect on the patentability of Applicant's invention. Microporosity in iron ore is known in the art; using microporous ore in the process taught by Applicant's invention is not.

The Examiner also rejects claims 34-36 on the grounds of double patenting and further in view of Varajao and USS. However, for the reasons discussed previously, this combination of prior art does not teach Applicant's invention. Specifically, reducing the water content to below 0.5% is not known nor taught by the prior art. Further, storing the iron ore for a period of one month or more for the purpose of releasing internal stresses and increasing the efficiency of the pre-drying process is not known in the prior art. These internal stresses and the need to increase drying efficiency only occur with lump ore that has the microporous structure. Thus, the limitation that microporous ore must be used is contained within the claims. Neither '690, Varajao, nor the USS publication recognize the problem and therefore fail to teach this claimed feature.

The Examiner rejects claims 37-40 on the grounds of obviousness type double patenting as being unpatentable over claims 1-5 of '690 in view of Varajao, USS, and JP 01152225 (hereinafter "'225".) In addition to the previous rejections, the Examiner rejects these claims on the grounds that '225 discloses and teaches the reclamation step in Applicant's invention. Applicant respectfully disagrees that '225 teaches the same method. The '225 reference does not disclose or even discuss the necessary step of storing the ore for a period of at least one month. While '225 does disclose and teach the

step of using the exhaust gas to fuel the heating of the ore, this procedure is well known in the art. What '225 discloses is nothing more than burning exhaust gas to provide heat to preheat the iron ore before it is put into the direct reduction furnace. The '225 reference does not specify at what temperature to dry/pretreat the iron ore; it simply suggests using exhaust gas to fuel the heater. The '225 reference discusses the need to use the heat and exhaust generated by the direct reduction furnace in order to conserve resources and not waste any potential source of heat/fuel. This is known in the art and does not render Applicant's invention obvious. More importantly, '225 is silent regarding maintaining the drying of the iron ore at a temperature less than 200°C. While '225 discloses using the waste gas to heat the ore prior to its introduction into the furnace, '225 is silent on the remaining aspects of the preparation of the ore. Thus, it does not disclose or teach Applicant's invention. Further, it does not render Applicant's invention obvious in view of '690, Varajao, and USS.

Conclusion

In light of the amendments to the claims and the above remarks, Applicant believes the claims are in proper form for allowance. Further, Applicant does not believe a terminal disclaimer is necessary in view of the above statements. However, even though applicant believes a terminal disclaimer is not necessary for the reasons mentioned above, upon the indication of allowance of these claims by the Examiner if a terminal disclaimer is filed, Applicant will file a terminal disclaimer.

Respectfully,

/Gregory N. Clements/
Gregory N. Clements
Attorney for Applicants – Reg. No. 30713

CLEMENTS | BERNARD
1901 Roxborough Road, Suite 250
Charlotte, North Carolina 28211 USA
Telephone: 704.790.3600
Facsimile: 704.366.9744
gclements@worldpatents.com